

FACILITATING GEOTHERMAL FIELD DEVELOPMENT THROUGH PUBLIC-PRIVATE PARTNERSHIPS IN MENENGAI, KENYA



MENENGAI GEOTHERMAL DEVELOPMENT OVERVIEW:

- **PROJECT COST:**
\$145 MILLION
- **FUNDERS:**
SREP, CTF, AfDB
- **IMPLEMENTER:**
GEOTHERMAL DEVELOPMENT COMPANY (KENYA)
- **PROJECT DURATION:**
2011-2018
- **COUNTRY SERVED:**
KENYA

DELIVERY CHALLENGES AND HOW PRACTITIONERS RESPONDED:

As a new public organization, GDC had limited financial and technical capacity to develop such a large-scale and risky geothermal development project. To mitigate the risks the project faced, Government of Kenya sought support from development finance institutions (DFIs) to access concessional finance and technical capacity building. The project received support from the Scaling-up Renewable Energy in Low-income Countries Program (SREP) of the Climate Investment Funds (CIF) and from the African Development Bank (AfDB), as well as co-financing from other development institutions. The project faced three delivery challenges.

Development challenge:

The core development challenge was to secure a reliable, sustainable and affordable power supply to meet current and future demand in Kenya, where energy demands are growing rapidly, and hydropower and fossil fuel thermal generation are increasingly unsustainable. To tackle this challenge, Kenya sought to increase production of geothermal energy, of which it has substantial resources. The Menengai project was undertaken by the Geothermal Development Company (GDC), set up by the government to undertake exploration and sell steam to independent power producers (IPPs). It was the first project to be brought from exploration to production drilling to steam field development by the GDC.

The first delivery challenge for the project was to provide a reward-risk ratio sufficient to attract private developers (Independent Power Producers - IPPs) to invest in the project due to perceived creditworthiness risks posed by the two government entities involved in the project. This challenge was addressed by the negotiation of a Partial Risk Guarantee (PRG) between the Government of Kenya (GoK) and the private developers, supported by the AfDB. The PRG mitigated the risk of a possible government failure under the Project Implementation and Steam Supply Agreement (PISSA) and the risk of non-payment under the Power Purchase Agreement (PPA).

The second delivery challenge was to reach a return on investment that made private developers' power plant projects bankable enough to attract private loan financing. This challenge was eased by creating a concessional lending program of USD 30 million supported by the Dedicated Private Sector Program (DPSP) of the Clean Technology Fund, channeled through AfDB for two IPPs. This concessional financing increased the bankability of these two private providers by lowering the cost of capital. Menengai demonstrated that public-private partnerships in geothermal development could be effective.

The third delivery challenge related to uncertainty about the exact potential of the Menengai steam reservoir. This remained a relevant issue in negotiations even as GDC advanced with production drilling. Most private investors do not consider providing finance until about 70 percent of the power capacity available in the wells has been drilled. This delayed agreements with the IPPs. GDC updated its internal steam status and resource assessment report in 2017, to incorporate latest data from recently drilled wells to confirm a sustainable reservoir capacity of 105 MW plus 20 percent reserve margin for the 25-year PPA period. The updated report was

accepted by QPEA and Sosian, but OrPower22 requested an independent study, which was planned for early 2018.

THE ROLE OF DEVELOPMENT FINANCE INSTITUTIONS:

The support received from both the CIF and AfDB was crucial in permitting the public sector to play its role of attracting private sector investment by absorbing the high development costs and mitigating resource availability risks. Similarly, investments in the steam development phase, made by the public sector and supported by DFIs, underpinned an effective package of financial incentives and risk assurance that attracted private sector investors. In the Menengai public-private partnership, DFI supported investments by the public sector in the exploration and field development phase permitted an effective package of financial incentives and risk assurance to get the private sector on board.

LESSONS FROM THE CASE STUDY:

By 2017, two of the three selected IPPs had entered into agreements to build steam power plants. The GDC model of absorbing resource risks helped to overcome a barrier to private sector involvement. Ensuring low-cost financing was important to increase the attractiveness of the investment. Ultimately, an effective package of financial incentives and risk assurance was needed in order to attract private developers.

While seemingly complex, the combination of government ministries and agencies, private investors and developers, development finance institutions as well as multilateral and bilateral donors proved the optimum mix of knowledge, financing and risk mitigation needed to support the expansion of installed geothermal capacity.

The iterative process adopted by the Menengai project could help inform future public-private

partnerships in the geothermal sector, in that the use of financial and risk mitigation solutions coupled with concessional loans helped address resource and exploration risk. The potential for alternative revenue streams has also emerged. In addition to selling steam solely for power generation, both steam and hot water can be sold for a variety of industrial and agricultural activities. GDC is currently experimenting with four pilot projects at Menengai to pasteurize milk, launder clothes, heat fishponds and heat greenhouses.

HOW THE CASE STUDY WAS USED:

This project serves as a good example for countries or entities seeking to develop alternative power sources, particularly when power development is seen as financially risky, uncertain, or in need of hedges against risk to engage private capital. ■

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